

What is claimed is:

1. An improved armature, for use with a magnetically coupled pushbutton switch of the type at least having a magnetic coupler layer and a substrate layer, the armature comprising:

an electrically conductive magnetic material having a top surface and a bottom surface;

a crown that raises above the top surface, the crown being closest to a heel end of the armature and farthest from a toe end of the armature; and

at least one protuberance that is closer to the heel end than to the toe end such that when the armature is in a rest position within the magnetically coupled pushbutton switch, there is a gap between the magnetic coupler layer and the heel end of the armature.

2. The armature of claim 1 further comprising one or more feet that are closer to the heel end than to the toe end, the feet depending below the bottom surface of the armature.

3. The armature of claim 1 wherein the armature is stamped to include the crown and the at least one protuberance.

4. The armature of claim 1 wherein the crown is attached to the top surface.

5. The armature of claim 1 wherein the at least one protuberance is symmetrical with a second protuberance such that the two protuberances are substantially

equidistant from the crown, and the two protuberances are substantially equidistant from the center of mass of the armature.

6. The armature of claim 1 wherein the at least one protuberance lies between the heel end and the crown.

7. The armature of claim 1 further comprising toe pads that depend from the bottom surface closer to the toe end than to the heel end.

8. The armature of claim 1 wherein the electrically conductive magnetic material is a magnetic material that has been plated so that it is electrically conductive.

9. A dual output magnetically coupled pushbutton switch comprising:
a magnetic coupler layer having an aperture;
a dual output armature made from an electrically conductive magnetic material having a top surface and a bottom surface;
a crown in the dual output armature that rises above the top surface, the crown being closest to a heel end of the armature and farthest from a toe end of the armature;
at least one protuberance in the dual output armature that is closer to the heel end than to the toe end such that when the dual output armature is in a rest position within the dual output magnetically coupled pushbutton switch, there is a gap between the magnetic coupler layer and the heel end of the armature;
a spacer layer having a cavity in which the dual output armature is housed;
and

a substrate layer that carries electrical conductors of the switch.

10. The dual output magnetically coupled pushbutton switch of claim 9 wherein the at least one protuberance is symmetrical with a second protuberance such that the two protuberances are substantially equidistant from the crown, and the two protuberances are substantially equidistant from the center of mass of the dual output armature.

11. The dual output magnetically coupled pushbutton switch of claim 9 further comprising a foot that is closer to the heel end than to the toe end, the foot depending below the bottom surface of the dual output armature.

12. The dual output magnetically coupled pushbutton switch of claim 9 wherein the crown and at least one protuberance are stamped into the dual output armature.

13. The dual output magnetically coupled pushbutton switch of claim 9 further comprising two toe pads that depend from the bottom surface closer to the toe end than to the heel end.

14. The dual output magnetically coupled pushbutton switch of claim 9 wherein the at least one protuberance is formed into the magnetic coupler layer to create the gap between the magnetic coupler layer and the heel end of the armature.

15. A single tactile magnetically coupled pushbutton switch comprising:
a magnetic coupler layer having an aperture;
an armature made from an electrically conductive magnetic material
having a top surface and a bottom surface;

a crown in the armature that rises above the top surface, the crown being closest to a heel end of the armature and farthest from a toe end of the armature;

at least one protuberance in the armature that is closer to the heel end than to the toe end such that when the armature is in a rest position within the single tactile magnetically coupled pushbutton switch, there is a gap between the magnetic coupler layer and the heel end of the armature;

a spacer layer having a cavity in which the dual output armature is housed;

a substrate layer that carries electrical conductors of the switch;

a first stable position of the switch, where the armature is magnetically coupled to the magnetic coupler layer in a rest position;

a second stable position of the switch, where the armature is partially actuated such that the heel end of the armature has broken away from the magnetic coupler layer and traveled to the substrate layer, but the toe end of the armature is in contact with the magnetic coupler layer; and

a third stable position of the switch, where the heel end of the armature and the toe end of the armature are in contact with the substrate layer, in a fully actuated position;

16. The single tactile magnetically coupled pushbutton switch of claim 15 further comprising one or more feet that are closer to the heel end than to the toe end, the feet depending below the bottom surface of the armature.

17. The single tactile magnetically coupled pushbutton switch of claim 16 wherein the electrical conductors are arranged such that a pair of electrical conductors is electrically connected by the feet when the switch is in the second stable position, and a third

electrical conductor is electrically connected to the pair of electrical conductors when the switch is in the third stable position.

18. The single tactile magnetically coupled pushbutton switch of claim 16 wherein a single foot lies between the heel end and the crown, and wherein there are two protuberances, one on either side of the crown, such that the protuberances are equidistant from the foot and the crown.

19. The single tactile magnetically coupled pushbutton switch of claim 15 further comprising two toe pads that depend from the bottom surface closer to the toe end than to the heel end.

20. The single tactile magnetically coupled pushbutton switch of claim 19 wherein the electrical conductors are arranged such that a common electrical conductor is electrically connected to the heel end of the armature when the switch is in the second stable position, and at least one additional electrical conductor is electrically connected to the armature at one of the toe pads when the switch is in the third stable position.